Los Alamos National Laboratory scientists will codirect $14.5 million National Center for Systems Biology

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Lab contributes computer modeling, antibody engineering capabilities

Los Alamos, New Mexico, July 28, 2009— Los Alamos National Laboratory scientists will codirect a new National Center for Systems Biology located at the University of New Mexico in Albuquerque.

The new Spatiotemporal Modeling Center (STMC) is funded by a $14.5 million, five-year grant from the National Institute for General Medical Sciences (NIGMS), one of the National Institutes of Health.

Los Alamos scientists will collaborate with researchers from UNM and Sandia National Laboratories under the leadership of Janet Oliver of UNM's Cancer Center and Department of Pathology.

"We welcome this tenth member of our National Centers for Systems Biology program," said James Anderson, who oversees systems biology awards at NIGMS. "The new center will apply large-scale, multidisciplinary approaches to understanding how the innate and adaptive immune systems interact."

"By sharing our expertise in computational modeling and antibody engineering, Los Alamos researchers will significantly contribute to this focused, interdisciplinary research effort to better understand human disease at the cellular level," said Laboratory Director Michael Anastasio. "Integrating measurements, models, and computing expertise will improve our understanding of the disease mechanisms at the molecular, cellular, and organism scales and advance systems biology," said the Lab's Associate Director for Chemistry, Life, and Earth Sciences Mary Neu.

According to one of the center's six codirectors, William Hlavacek of the Lab's Theoretical Biology and Biophysics group, the center's primary goal is to develop predictive models of cellular decision-making processes to better study the causes of human disease and explore new treatment options. The unique tools and expertise available at Los Alamos could well help lead to new ways of treating various allergic diseases and multiple cancers, added codirector Andrew Bradbury of Advanced Measurement Science.

Bradbury will contribute his extensive knowledge in the field of antibody development, while Hlavacek and Byron Goldstein of the Theoretical Biology and Biophysics group will develop computational models of complex biological systems. Chang-Shung Tung, also of Theoretical Biology and Biophysics, will perform computational modeling of macromolecules.

Systems biology is an emerging interdisciplinary field at the intersection of biology, mathematics, engineering, and the physical sciences. Using experimental and computational approaches, it builds on existing knowledge of genetic and molecular functions to study and understand biological processes in cells, tissues, and organisms.